



TEST REPORT

Of IECNA LM-80-15

Kunde: <i>Client:</i>	Aurora (Shanghai) Technology Co., Ltd
Adresse: <i>Address:</i>	Room 221, 2F, Building 6, No.7001, Zhongchun Road, Minhang District, Shanghai
Hersteller: <i>Manufacturer:</i>	Aurora (Shanghai) Technology Co., Ltd
Adresse: <i>Address:</i>	Room 221, 2F, Building 6, No.7001, Zhongchun Road, Minhang District, Shanghai
Name der Marke: <i>Brand Name:</i>	N/A
Beschreibung des Produkts: <i>Product Description:</i>	LED Point Light
Modelle: <i>Models:</i>	PP0003-LED1.8M-RGBW-85D
Bewertung: <i>Rating:</i>	DC9V,100mA,1W (Lamp bead), DC24V, 1.8W(LED Point Light) Main test lamp beads
Verfahren: <i>Method:</i>	Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules
Prüfergebnis*: <i>Test result*:</i>	Please see the following test data

Datum der Prüfung: <i>Date of Test:</i>	Datum der Emission: <i>Date of Issue:</i>	Klassifizierung: <i>Classification:</i>	Gegenstand der Prüfung: <i>Test item:</i>
2021-06-10-2022-06-20	2022-06-23	Commission Test	LM-80 Test

Prüflabor (Testlabor) / Testing Laboratory:
Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Compiled von/Compiled by:	Check von/Check by:	Genehmigt von/Approved by:
 Zero Huang/ Project Engineer	 Ian Luo/ Director	 Jesse Liu/ Manager

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

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Test Summary

Life test condition			Summary of result				
Test condition	Current (mA)	Case temperature (°C)	Test duration (h)	Average lumen maintenance (%)	Maximum chromaticity shift ($\Delta u'v'$)	Average Power Density (W/mm ²)	Average Current Density (mA/mm ²)
1	100	55	9000	97.49%	0.0029	0.1020	10.2041
2	100	85	9000	97.08%	0.0032		
3	100	105	9000	96.58%	0.0035		

1. Number of LED Light Sources tested

- 25 Packages tested at actual case temperature 55.9°C
- 25 Packages tested at actual case temperature 85.7°C
- 25 Packages tested at actual case temperature 105.5°C

2. Description of LED Light Sources

- Part Number:PP0003-LED1.8M-RGBW-85D
- Part Type: LED Point Light
- IF =100mA, CCT(Nominal) = 4000K

3. Description of auxiliary equipment

- 1) EVERFINE LT-200A Accelerated Aging-Life Test System for LEDs
- 2) Instrument Integrating sphere 0.5m
- 3) SENSING SPR-3000 Photometric, Colorimetric& Electric System for Light Sources

4. Operating time

- LED packages are driven with a constant direct current.
- Number of units : 25 at 55°C, 85°C and 105°C
 - Drive current : 100mA
 - Typical voltage :9V





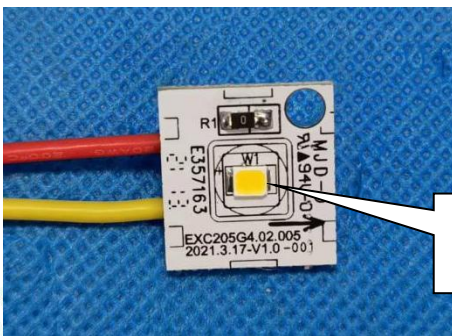
5. Ambient conditions including airflow, temperature and relative humidity

The minimal airflow is maintained in chamber.

The ambient temperature around the LED packages inside chamber is controlled by air flowing and the thermocouple readings are monitored.

- Case temperature : Contorlled to -2°C
- Surrounding air temperature : Contorlled to -5°C
- Relative humidity : < 65%RH

6. Case temperature (Test point temperature)



Ts Measurement Point

7. Drive current of the LED Light Sources during lifetime test

See Sub-clause 9.1, 9.2 and 9.3

8. Initial luminous flux and forward voltage

See the table

9. Lumen maintenance data for each individual LED Light Sources

See the table

Quantity	Model	Serial Number
25	PP0003-LED1.8M-RGBW-85D	A01-A25 (55°C)
25	PP0003-LED1.8M-RGBW-85D	B01-B25 (85°C)
25	PP0003-LED1.8M-RGBW-85D	C01-C25 (105°C)





9.1 Test condition 1: 55 °C, Drive Current : 100mA

Table with 13 columns: Item, VF(V), Flux(lm), Ra, and T=55°C Luminous Maintenance (%) (0h, 1000h, 2000h, 3000h, 4000h, 5000h, 6000h, 7000h, 8000h, 9000h). Rows include individual test items A01-A25, Avg., Med., ST dev., Max., and Min.





9.1.1 Test condition 1: 55 °C, Drive Current : 100mA

No.	T=55°C Chromaticity Shift ($\Delta u'v'$)											
	0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
	u'	v'	CCT(K)									
A01	0.2227	0.5035	4058	0.0001	0.0004	0.0007	0.0009	0.0013	0.0016	0.0019	0.0024	0.0027
A02	0.2226	0.5033	4060	0.0004	0.0006	0.0008	0.0009	0.0013	0.0017	0.0020	0.0026	0.0029
A03	0.2223	0.5038	4049	0.0002	0.0006	0.0010	0.0010	0.0014	0.0017	0.0021	0.0027	0.0033
A04	0.2221	0.5037	4059	0.0003	0.0005	0.0008	0.0010	0.0013	0.0016	0.0020	0.0024	0.0027
A05	0.2227	0.5033	4043	0.0002	0.0005	0.0008	0.0011	0.0010	0.0013	0.0018	0.0024	0.0029
A06	0.2226	0.5033	4054	0.0002	0.0005	0.0010	0.0011	0.0013	0.0016	0.0021	0.0025	0.0026
A07	0.2228	0.5035	4056	0.0004	0.0006	0.0008	0.0010	0.0014	0.0017	0.0019	0.0024	0.0028
A08	0.2225	0.5033	4050	0.0001	0.0004	0.0006	0.0011	0.0016	0.0019	0.0023	0.0029	0.0030
A09	0.2222	0.5038	4051	0.0002	0.0003	0.0005	0.0010	0.0014	0.0017	0.0019	0.0023	0.0027
A10	0.2221	0.5037	4045	0.0004	0.0007	0.0008	0.0010	0.0013	0.0017	0.0018	0.0024	0.0027
A11	0.2221	0.5039	4058	0.0002	0.0003	0.0006	0.0008	0.0012	0.0015	0.0022	0.0027	0.0031
A12	0.2223	0.5038	4054	0.0002	0.0006	0.0008	0.0009	0.0013	0.0017	0.0021	0.0025	0.0027
A13	0.2221	0.5034	4056	0.0002	0.0004	0.0006	0.0012	0.0016	0.0019	0.0022	0.0023	0.0025
A14	0.2226	0.5040	4044	0.0002	0.0005	0.0008	0.0012	0.0014	0.0017	0.0019	0.0024	0.0028
A15	0.2225	0.5037	4055	0.0001	0.0003	0.0006	0.0010	0.0013	0.0016	0.0021	0.0025	0.0029
A16	0.2222	0.5035	4053	0.0001	0.0004	0.0007	0.0011	0.0015	0.0017	0.0021	0.0028	0.0032
A17	0.2228	0.5040	4051	0.0003	0.0006	0.0009	0.0012	0.0015	0.0018	0.0023	0.0027	0.0030
A18	0.2226	0.5037	4048	0.0003	0.0006	0.0009	0.0013	0.0017	0.0022	0.0023	0.0027	0.0029
A19	0.2223	0.5034	4055	0.0001	0.0003	0.0005	0.0008	0.0011	0.0015	0.0018	0.0025	0.0030
A20	0.2221	0.5038	4058	0.0002	0.0004	0.0008	0.0011	0.0014	0.0018	0.0021	0.0027	0.0032
A21	0.2226	0.5039	4045	0.0001	0.0003	0.0007	0.0012	0.0013	0.0017	0.0019	0.0023	0.0028
A22	0.2225	0.5035	4047	0.0003	0.0006	0.0008	0.0010	0.0013	0.0016	0.0022	0.0025	0.0029
A23	0.2227	0.5033	4057	0.0001	0.0004	0.0008	0.0013	0.0016	0.0017	0.0021	0.0028	0.0034
A24	0.2225	0.5039	4048	0.0002	0.0004	0.0005	0.0008	0.0014	0.0017	0.0023	0.0024	0.0029
A25	0.2223	0.5038	4053	0.0002	0.0005	0.0007	0.0009	0.0015	0.0018	0.0024	0.0026	0.0032
Avg.	0.2224	0.5036	4052	0.0002	0.0005	0.0007	0.0010	0.0014	0.0017	0.0021	0.0025	0.0029
Med.	0.2225	0.5037	4053	0.0002	0.0005	0.0008	0.0010	0.0014	0.0017	0.0021	0.0025	0.0029
ST dev.	0.0002	0.0002	5.0787	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002
Max.	0.2228	0.5040	4060	0.0004	0.0007	0.0010	0.0013	0.0017	0.0022	0.0024	0.0029	0.0034
Min.	0.2221	0.5033	4043	0.0001	0.0003	0.0005	0.0008	0.0010	0.0013	0.0018	0.0023	0.0025





9.2 Test condition 2: 85 °C, Drive Current : 100mA

Table with 13 columns: Item, VF(V), Flux(lm), Ra, and T=85°C Luminous Maintenance (%) (0h, 1000h, 2000h, 3000h, 4000h, 5000h, 6000h, 7000h, 8000h, 9000h). Rows include items B01-B25, Avg., Med., ST dev., Max., and Min.





9.2.1 Test condition 2: 85 °C , Drive Current : 100mA

No.	T=85°C Chromaticity Shift ($\Delta u'v'$)											
	0 h			1000h	2000h	3000h	4000h	5000h	6000h	7000h	8000h	9000h
	u'	v'	CCT(K)									
B01	0.2229	0.5032	4065	0.0003	0.0007	0.0010	0.0013	0.0015	0.0020	0.0025	0.0028	0.0030
B02	0.2221	0.5032	4065	0.0003	0.0005	0.0007	0.0010	0.0014	0.0018	0.0024	0.0029	0.0032
B03	0.2224	0.5035	4059	0.0002	0.0004	0.0006	0.0010	0.0014	0.0018	0.0025	0.0029	0.0031
B04	0.2219	0.5039	4065	0.0003	0.0007	0.0009	0.0013	0.0018	0.0021	0.0023	0.0027	0.0029
B05	0.2224	0.5033	4054	0.0002	0.0005	0.0008	0.0014	0.0017	0.0023	0.0024	0.0028	0.0031
B06	0.2223	0.5036	4062	0.0004	0.0008	0.0009	0.0013	0.0019	0.0023	0.0025	0.0030	0.0032
B07	0.2230	0.5037	4066	0.0002	0.0006	0.0009	0.0011	0.0016	0.0020	0.0023	0.0029	0.0030
B08	0.2226	0.5031	4057	0.0004	0.0008	0.0010	0.0012	0.0018	0.0020	0.0025	0.0028	0.0031
B09	0.2219	0.5037	4064	0.0003	0.0007	0.0009	0.0013	0.0019	0.0023	0.0027	0.0032	0.0034
B10	0.2220	0.5039	4061	0.0002	0.0006	0.0008	0.0014	0.0018	0.0021	0.0027	0.0033	0.0034
B11	0.2224	0.5041	4064	0.0003	0.0005	0.0006	0.0009	0.0015	0.0020	0.0024	0.0028	0.0030
B12	0.2223	0.5040	4060	0.0002	0.0006	0.0009	0.0013	0.0017	0.0020	0.0025	0.0029	0.0032
B13	0.2219	0.5037	4067	0.0003	0.0005	0.0008	0.0014	0.0016	0.0021	0.0027	0.0031	0.0032
B14	0.2230	0.5037	4053	0.0002	0.0006	0.0009	0.0013	0.0018	0.0023	0.0026	0.0030	0.0032
B15	0.2222	0.5039	4060	0.0004	0.0007	0.0010	0.0015	0.0018	0.0022	0.0025	0.0031	0.0033
B16	0.2224	0.5034	4063	0.0003	0.0005	0.0008	0.0014	0.0017	0.0022	0.0026	0.0029	0.0030
B17	0.2226	0.5037	4059	0.0004	0.0007	0.0010	0.0011	0.0018	0.0021	0.0025	0.0029	0.0033
B18	0.2229	0.5037	4059	0.0002	0.0005	0.0009	0.0013	0.0018	0.0021	0.0027	0.0031	0.0032
B19	0.2225	0.5033	4068	0.0003	0.0005	0.0007	0.0012	0.0016	0.0022	0.0025	0.0030	0.0033
B20	0.2224	0.5034	4073	0.0002	0.0006	0.0008	0.0011	0.0015	0.0020	0.0027	0.0032	0.0034
B21	0.2230	0.5040	4054	0.0003	0.0007	0.0009	0.0012	0.0019	0.0024	0.0028	0.0029	0.0032
B22	0.2223	0.5034	4054	0.0004	0.0008	0.0010	0.0013	0.0017	0.0022	0.0026	0.0029	0.0032
B23	0.2227	0.5034	4066	0.0002	0.0004	0.0009	0.0014	0.0017	0.0022	0.0025	0.0029	0.0032
B24	0.2227	0.5042	4059	0.0004	0.0006	0.0009	0.0012	0.0019	0.0023	0.0027	0.0030	0.0031
B25	0.2222	0.5036	4058	0.0002	0.0007	0.0008	0.0013	0.0016	0.0022	0.0026	0.0029	0.0031
Avg.	0.2224	0.5036	4061	0.0003	0.0006	0.0009	0.0012	0.0017	0.0021	0.0025	0.0030	0.0032
Med.	0.2224	0.5037	4061	0.0003	0.0006	0.0009	0.0013	0.0017	0.0021	0.0025	0.0029	0.0032
ST dev.	0.0003	0.0003	5.0000	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001
Max.	0.2230	0.5042	4073	0.0004	0.0008	0.0010	0.0015	0.0019	0.0024	0.0028	0.0033	0.0034
Min.	0.2219	0.5031	4053	0.0002	0.0004	0.0006	0.0009	0.0014	0.0018	0.0023	0.0027	0.0029





9.3 Test condition 3: 105 °C, Drive Current : 100mA

Table with 13 columns: Item, VF(V), Flux(lm), Ra, and T=105°C Luminous Maintenance (%) (0h, 1000h, 2000h, 3000h, 4000h, 5000h, 6000h, 7000h, 8000h, 9000h). Rows include items C01-C25, Avg., Med., ST dev., Max., and Min.





9.3.1 Test condition 3: 105 °C, Drive Current : 100mA

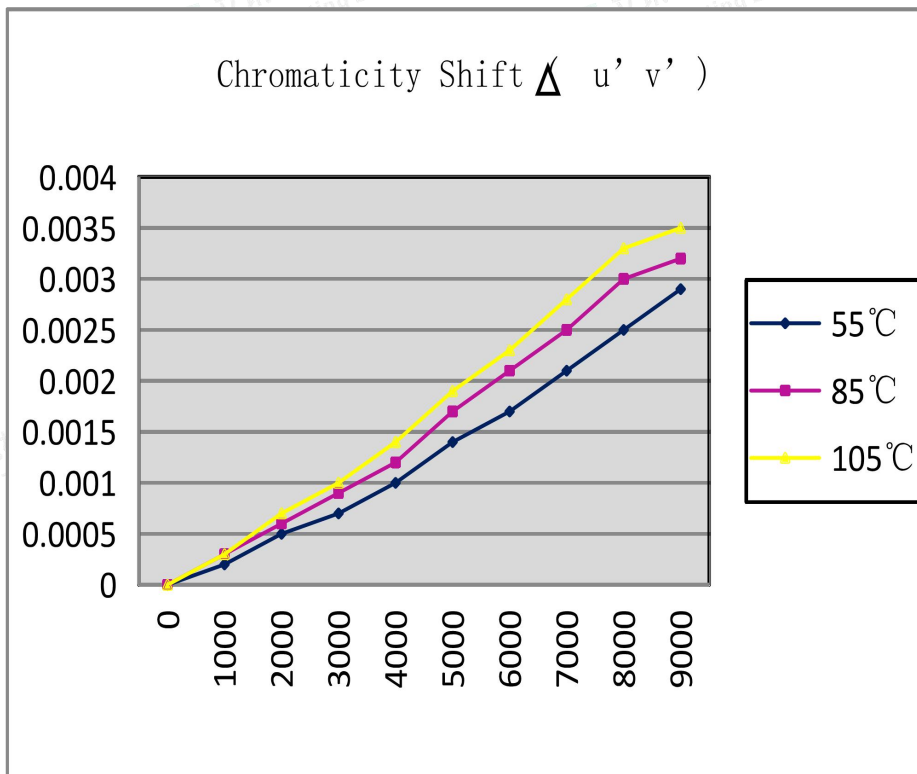
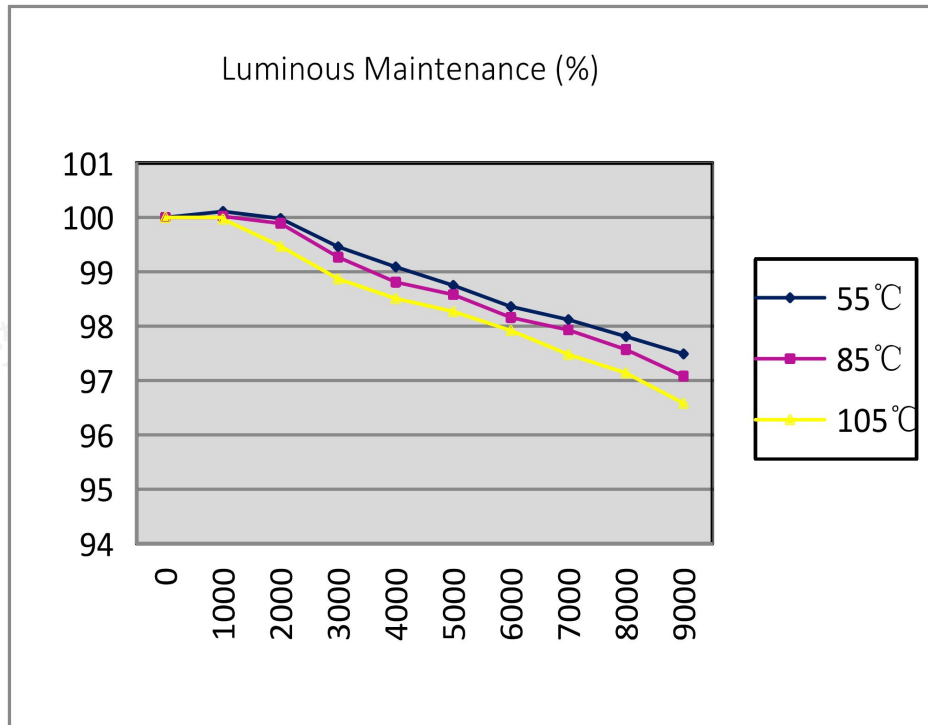
T=105°C Chromaticity Shift (Δu'v')

Table with 13 columns: No., 0 h (u', v', CCT(K)), 1000h, 2000h, 3000h, 4000h, 5000h, 6000h, 7000h, 8000h, 9000h. Rows include individual samples C01-C25, Avg., Med., ST dev., Max., and Min.





9.4 Chart





10. Observation of failures

No optical, Electrical or mechanical failure of any LED Package was seen during the lifetime testing.

11. Photometric measurement uncertainty

2%

12. TM-21-11 report: Projecting long term lumen maintenance of LED Light Sources

	Test Condition 1 - 55°C Case Temp	Test Condition 1 - 85°C Case Temp	Test Condition 1 -105°C Case Temp
Test Duration:	9000 hours	9000 hours	9000 hours
Failures Observed:	0	0	0
α :	3.215E-06	3.473E-06	3.947E-06
β :	1.003	1.003	1.002
Reported L ₇₀ :	>54000	>54000	>54000
Reported L ₈₀ :	>54000	>54000	53000
Reported L ₉₀ :	34000	31000	27000





13. ENERGY STAR® LM-80 Cover Sheet

Administrative Information	
Tested subcomponent series:	-
Tested subcomponent model number:	PP0003-LED1.8M-RGBW-85D
Report issue date:	June 23, 2022
Report revision date (if applicable):	-
Testing start date:	June 10, 2021
Testing completion date:	June 20, 2022
DUT sampling method:	<p>LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.</p> <p>These manufacturing lots are picked to represent a wide parametric distribution.</p> <p>Each Sample is soldered to all of the reliability stress boards for a given set of IESNA LM-80 tests.</p>
DUT Identification	
DUT manufacturer's name:	Aurora (Shanghai) Technology Co., Ltd
DUT identification, e.g., model number:	PP0003-LED1.8M-RGBW-85D
Description of DUT, including if the DUT is an LED package or module:	LED Point Light
DUT Characteristics	
Total input power (W):	1
Average current density per LED die (mA/mm ²):	10.2041
Average power density per LED die (W/mm ²):	0.1020
Representative CRI (Ra) of the tested sample set:	80
Minimum die edge to die edge spacing:	-



Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

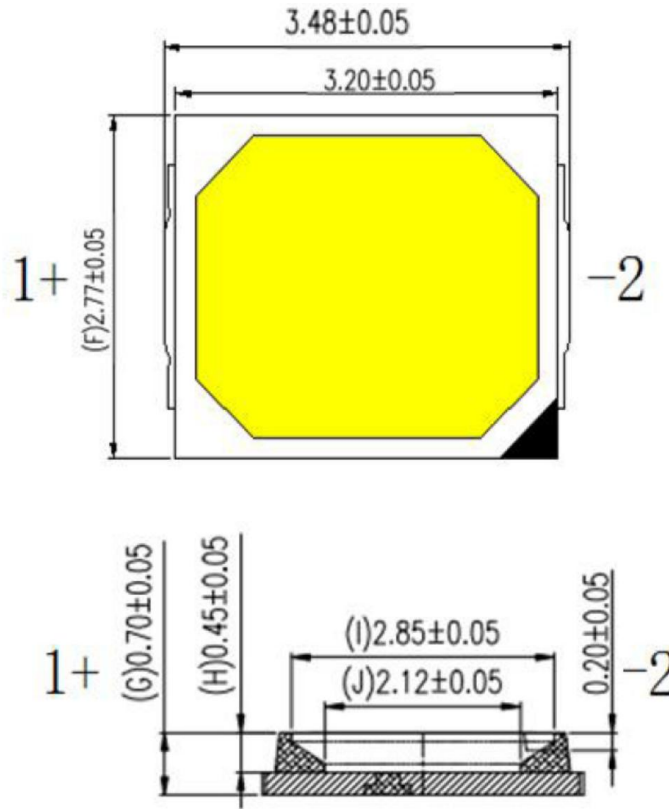
Add: 101-201, No.39 Buliding, Xialang Industrial Zone, Heshuikou Community, Matian Street Guangming New District, Shenzhen,Guangdong Prov. 518000 China

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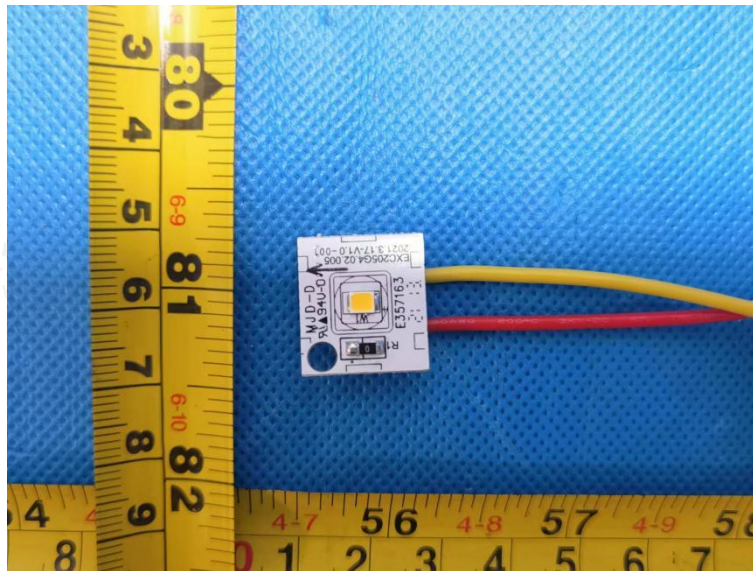
Scan code to check authenticity



14.Mechanical Dimensions



15. Photo of samples:



*****END OF THIS REPORT*****

